

In summary, the improved system of the present invention by utilizing the correlation properties of the prior art system retains its concomitant rapid acquisition capability since for acquisition of the transmitted nonlinear MAJ ($C_1, C_2, \dots, C_{n-1}, Z$) composite code, the total number of code bits required to be searched is still equal to the sum of the individual lengths of composite codes, R_1, R_2, \dots and R_n . At the same time, the security of the improved system from the threat of enemy analysis is increased dramatically over that of the prior art system through the nontransmission of the component code C_n , the time delay of the sequence of the component codes, C_1, C_2, \dots, C_{n-1} , which goes into the formation of the MAJ and MOD composite codes, and the nonlinearizing of the latter.

We claim:

1. A method of producing a code with enhanced acquisition security, comprising the steps of:

generating a plurality of linear component codes, C_1, C_2, \dots, C_n ;

combining said linear component codes to form a linear first composite code in accordance with a first composite rule of such a character that said first composite code does not correlate with said component codes;

nonlinearizing said first composite code to form a nonlinear second composite code; and

combining said linear component codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code to form a nonlinear acquisition composite code in accordance with a second composite rule of such a character that at least one of said component codes correlates with said acquisition composite code.

2. A method of producing a code with enhanced acquisition security, comprising the steps of:

generating a plurality of linear component codes, C_1, C_2, \dots, C_n ;

combining said linear component codes to form a linear first composite code in accordance with a first composition rule of such a character that said first composite code does not correlate with said component codes;

nonlinearizing said first composite code to form a nonlinear second composite code;

time delaying said component codes, C_1, C_2, \dots, C_{n-1} ; and

combining said delayed codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code to form a nonlinear acquisition composite code in accordance with a second composition rule of such a character that at least one of said delayed codes correlates with said acquisition composite code.

3. A method of producing a code with enhanced acquisition security, comprising the steps of:

generating a plurality of linear component codes, C_1, C_2, \dots, C_n ;

combining said linear component codes in accordance with a modulo-2 addition rule to form a linear first composite code;

nonlinearizing said first composite code by applying the same to an encrypter operating in a decrypt mode to form a nonlinear second composite code;

time delaying said component codes, C_1, C_2, \dots, C_{n-1} ; and

combining said time delayed codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code in accordance with a Boolean majority voting rule to form a nonlinear acquisition composite code.

4. A system for producing a code with enhanced acquisition security, comprising:

means for generating a plurality of linear component codes, C_1, C_2, \dots, C_n ;

means for combining said linear component codes to form a linear first composite code in accordance with a first composition rule of such a character that said first composite code does not correlate with said component codes;

means for nonlinearizing said first composite code to form a nonlinear second composite code; and

means for combining said linear component codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code to form a nonlinear acquisition composite code in accordance with a second composite rule of such a character that at least one of said component codes correlates with said acquisition composite code.

5. A system for producing a code with enhanced acquisition security, comprising:

means for generating a plurality of linear component codes, C_1, C_2, \dots, C_n ;

means for combining said linear component codes to form a linear first composite code in accordance with a first composition rule of such a character that said first composite code does not correlate with said component codes;

means for nonlinearizing said first composite code to form a nonlinear second composite code;

means for time delaying said component codes, C_1, C_2, \dots, C_{n-1} ; and

means for combining said delayed codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code to form a nonlinear acquisition composite code in accordance with a second composition rule of such a character that at least one of said delayed codes correlates with said acquisition composite code.

6. The system for producing a code as recited in claim 5, wherein:

said first composition rule is a modulo-2 addition rule; said nonlinearizing means comprises an encrypter operating in a decrypt mode to which said first composite code is applied to form said nonlinear second composite code; and

said second composition rule is a Boolean majority voting rule.

7. A coding method for communication between a transmitter and a receiver with enhanced security, comprising the steps of:

(I) at the transmitter,

(a) generating a plurality of linear acquisition component codes, C_1, C_2, \dots, C_n ;

(b) combining said acquisition component codes to form a linear first composite code in accordance with a first composition rule of such a character that said first composite code does not correlate with said component codes,

(c) nonlinearizing said first composite code to form a nonlinear second composite code,

(d) combining said linear component codes, C_1, C_2, \dots, C_{n-1} , with said nonlinear second composite code to form a nonlinear acquisition composite code in accordance with a second composition rule of such a character that at least one of said component codes correlates with said acquisition composite code, and

(e) transmitting said nonlinear acquisition composite code; and